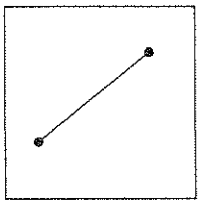
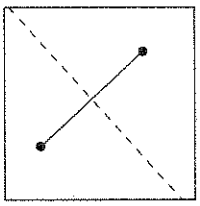
Guided Investigation 2.2

FOLDING THE PERPENDICULAR BISECTOR OF A LINE SEGMENT

Step 1: Use your straightedge to draw a line segment on a patty paper.

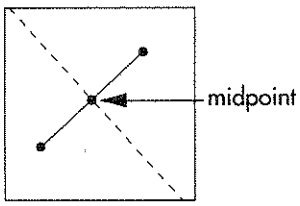


Step 2: Fold the paper so one endpoint lies on top of the other. Open it up.



Does the crease divide the segment into two equal parts?

Step 3: Place a point where the crease intersects the segment. This point is called the midpoint of the segment.

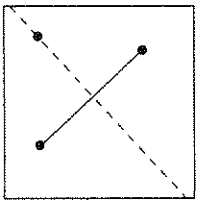


Step 4: Use a corner of another patty paper to check if the angles formed by the crease and the given segment are right angles.

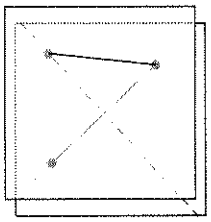
This is a very useful construction. You can use this method to find midpoints, construct perpendiculars, make 90 degree angles, and divide segments into equal parts. If you wish to create just a midpoint, bring the endpoints of the segment together, and pinch!

How can you describe the points on the perpendicular bisector? What is special about each point on the perpendicular bisector of a segment?

Step 5: Place a point on your folded perpendicular bisector.



Step 6: Compare the distances from the point to each endpoint. You can do this by using a second patty paper to measure the distance between the point and one endpoint and then comparing this distance with the distance between the point and the other endpoint.



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What is true about the distances from the point on the perpendicular bisector to each of the two endpoints of the segment? Is the point closer to one endpoint or the other?

Your next patty paper conjecture could be:

If a point is on the perpendicular bisector of a segment, then it is equally distant from the _____.

In a later investigation you will use this conjecture to find the center of the circumscribed circle of a triangle.